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ganized, similar to the medical and bar associations, which would be an influential force in improving the conditions under which our work is done. It should not be forgotten that the maintenance of high standards in the university is as important for the community as for the professor, and his efforts on its behalf are by no means narrowly selfish. The future of the American university does not depend upon its machinery, but upon its men. The danger of a bad system is that it may gradually demoralize the spirit and ideals of the men working under it, and may keep from it or drive from it the kind of men who are needed.

When a speaker has only twenty minutes in which "to set the crooked straight," he can not be expected to devote much time to explaining that it is not so very crooked and is made of sound timber. The university is the noblest monument which we have inherited from the past and at the same time the most powerful engine driving forward our civilization. We owe to it the tribute of truth and the duty of service. It is our part to make it a democracy of scholars serving the larger democracy to which it belongs.

J. McKEEN CATTELL

#### CALVIN MILTON WOODWARD

CALVIN MILTON WOODWARD was born in Fitchburg, Mass., on August 25, 1837. He was graduated from Harvard in 1860 with the degree of A.B. and with the honor of membership in Phi Beta Kappa. In 1905 Washington University, and in 1908 the University of Wisconsin, conferred upon him the degree of LL.D.

During 1860-65 he was principal of the Newburyport, Mass., high school. In 1862 he was granted leave of absence for one year. During this period he served first as lieutenant and then as captain of a company in the 48th Massachusetts Volunteers. His regiment helped patrol the Mississippi in Louisiana and was under fire in the siege and storming of Port Hudson.

In 1865 he came to St. Louis, where in the service of Washington University and of his

adopted city and state he passed the last forty-nine years of an active, energetic and fruitful career. At first he was the vice-principal of the academic department. In 1866 he was doing college work and was principal of the O'Fallon Polytechnic Institute. In 1868, under the authority of the university corporation, he began the organization of an engineering department. In 1870 he was made Thayer professor of mathematics and applied mechanics, and dean of the polytechnic faculty. In 1880 the St. Louis Manual Training School was opened, with Dean Woodward, its organizer, as director, and immediately it became the educational novelty of St. Louis, and for that matter, of America.

From this time, with some minor changes, he held until 1896 the positions of Thayer professor of mathematics and applied mechanics, dean of the engineering school and director of the manual training school. He resigned the deanship in 1896, but resumed the duties of that office in 1901 and again from that time carried his threefold official title until his final retirement from active service in the summer of 1910. He had remained in the harness until the close of his seventy-third year, when he retired upon the Carnegie Foundation. "His eye was not dim and" apparently, "his natural force was not abated." Four more happy years came to him in literary work, on educational boards and in the free use of his time and talent in the lecture field. On January 10, just passed, he was actively at work in behalf of a philanthropic enterprise which had deeply interested him for two or three years when the cerebral lesion attacked him which on January 6 proved fatal. After a private funeral service at the house, January 12, there was held at the church of which Dr. Woodward was an active member a memorial service at which Dr. Dodson, his pastor, Mr. Langsdorf, his pupil and colleague, as well as his successor as dean, Mr. W. A. Layman, president of the Wagner Electric Company, and Mr. Ben. Blewett, city superintendent of public instruction, spoke of his services to society, to the university, to mod-

ern scientific and civic progress and to general education.

Through all his busy years he lectured frequently in America on educational and scientific subjects and on special occasions in England. His contributions were numerous to periodicals and to the proceedings of the many learned societies of which he was a member. He was the author of two volumes upon manual training, one published by Heath & Co., the other in London and afterwards by the Scribners. During the years of his retirement he has written and published a notable text-book of more than 500 pages upon rational and applied mechanics. Every page shows the mature teacher and the clear logician reasoning with his students. Though published last year, the work is about to pass to a second edition.

It was fortunate for Mr. Eads, and for the engineering fraternity as a whole, that, from the bold inception to the triumphant completion of the St. Louis bridge, Dr. Woodward, then an enthusiastic young professor in his thirties, watched every operation and knew the great work to the minutest details. He went to the bottom of the piers, where men were working under more than four atmospheres of pressure. He was among the first to walk the plank connecting the approaching ends of the big middle arch. He knew the designs, drawings, contracts and unusual tests of material. With some of his students he was a passenger on one of the fourteen locomotives that tested the structure. When the work was done, which to this day stands in a class by itself, Captain Eads entrusted to Professor Woodward the task of writing the history of the achievement. This record occupied two busy years and remains an enduring monument to its author and to James B. Eads. At the time of its appearance it was said to be the most important contribution to engineering literature that had appeared in America. The book is widely distributed among the scientific libraries of the country; but the original edition is nearly exhausted and another will probably never be printed.

About that time, Professor Woodward, im-

pelled by the serious needs and deficiencies of those of his students who were ambitious to become engineers, conceived and developed the manual-training idea. Upon this phase of his work it is not necessary for us to dwell. The innovation had many and bitter enemies, for it was not then apparent how manual training could help in making educated men. But a large section of the educational world in America now believes in it and has adopted it in many secondary schools as one element in the formation of the efficient citizen.

At a critical time in the development of the University of Missouri Dr. Woodward was a curator and president of the board. His service at that time to higher education in his state will never be forgotten. While the Louisiana Purchase Exposition was in progress at St. Louis, Dr. Woodward was president of the Aeronautical Congress which did much to create a strong faith throughout the country that the conquest of the air was near at hand, and he himself made important contributions towards the solution of the problem.

In 1894 Dr. Woodward was president of the Society for the Promotion of Engineering Education, and in 1909-10 he was president of the North Central Association of Colleges and Secondary Schools, the first time in the history of that useful organization that a college professor not of presidential rank presided over its deliberations.

Dr. Woodward was chosen president of the American Association for the Advancement of Science for the meeting of 1906. That the choice was a happy one no one could deny who was fortunate enough to be present at the opening session in New Orleans. Since the Civil War this was the first visit of the American Association to a southern city. Southern hosts and northern guests vied with each other to make the occasion a delightful one. As usual the first formal session of the meeting was given up to courteous welcomes and responses. The splendid way in which President Woodward rose to the possibilities of graceful speech none of those present will ever forget.

Dr. Woodward served his city conspicuously

in many matters pertaining to its growth and development. At one time the city census was questioned and he was chosen superintendent to repeat and verify it. He was always ready and forcible in the discussion of the engineering problems of the city, and served terms as president of both the St. Louis Engineers Club and of the St. Louis Academy of Science. As a member of the city school board and several times as its president, he has given character and direction to the public school system of St. Louis.

Professor Woodward married Fanny S. Balch, of Newburyport, Mass., in September, 1863. She survives him together with three daughters, two of whom are married. His home life was an ideal one; to enter within its circle was always a privilege.

In hasty review we have selected only a few of the instances where Calvin Milton Woodward has come prominently before the country. The story of a long life of cheerful labor and distinguished service in the college halls can never be told. There is no tangible record of the daily lessons enforced with an unflinching and overflowing spirit of optimism. But it is this work and this spirit that produce a sure and lasting effect upon the lives of students. Just as the gentle sunshine is the most potent force in nature, so the efficient teacher, who on the whole is quite often an object of condescending sympathy in our social state, is nevertheless the mightiest agent in the progress and development of society, for he is developing its coming leaders and, therefore, more than any other agency, is shaping its destiny. Happy is that teacher who knows his power and lives true to his high calling. His name may soon be forgotten, but the essence of his life and labor passes on from heart to heart and from generation to generation.

Such a man was Dr. Woodward. As a teacher he lived. As a teacher he sought his life's reward. A little more than a year ago in a company where were many of his former students he expressed his conviction that no epitaph could more highly honor him than

the simple statement "He was a teacher of men."

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#### ROBERT KENNEDY DUNCAN

By the death on February 18 of Dr. Robert Kennedy Duncan, director of the Mellon Institute of Industrial Research of the University of Pittsburgh, American science lost one of its most illustrious devotees. Dr. Duncan was known to the public at large in two important lines of service. First, as an interpreter of science, in which branch he was preeminent; he gave life to the most abstruse things of cold science and made them of intense interest. His books, "The New Knowledge," "The Chemistry of Commerce" and "Some Chemical Problems of To-day," while of the highest scientific accuracy, are so written as to hold the reader's sustained attention to the end. The other line in which he will be remembered is as the originator of the unique system of *the service of science to industry*. Dr. Duncan felt that he was fortunate in being able to live to see this system established on a permanent basis in the Mellon Institute of Industrial Research. With his usual farsightedness he carefully trained those who were to take his place when he was gone and the institute embodying the system he originated will go on as a living monument to its founder.

Certain of the ideas he had in mind in working out a practical method whereby the learning of the university could be brought to the service of industry are interesting, in that they show prominent traits of his character. He once told me that he experienced the keenest pleasure of achievement when he thought of the opportunities he was able to offer to young men through the working of this system. He loved to speak of his laboratory as a center of opportunity for young men. And that fact really indexes the keynote of his character. He was absolutely unselfish. He sought nothing for himself and was continually trying to advance his "boys,"